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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LANGEL, WAYNE A

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 10/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

920800

Applicant(s)

Page

Examiner

Langel

Group Art Unit

1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-11 is/are pending in the application.
- ☐ Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-11 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 2
- ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jones '325. Jones '325 discloses a method for removing nitrogen oxides from a gas stream comprising the steps of contacting a gas stream which contains nitrogen oxides, including nitrogen monoxide and nitrogen dioxide at a molar ratio of nitrogen monoxide to nitrogen dioxide greater than about 4 in a conversion zone with an injection gas that comprises oxygen and a vaporized peroxy initiator. (See the paragraph bridging columns 1 and 2, and column 5, line 31 - column 6, line 2 of

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Jones '325.) Jones '325 teaches at column 6, lines 52-61 that hydrogen peroxide may be a peroxy initiator. The reactions recited in applicant's claim 1 would inherently occur during the process of Jones '325, since nitrogen monoxide, nitrogen dioxide, hydrogen peroxide and oxygen are all present in the reaction zone.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones '325 as applied to claim 1 above, and further in view of Jones '298. It would be obvious from Jones '298 to modify the process of Jones '325 by introducing the hydrogen peroxide in aerosol form, since Jones '298 discloses a method for removing oxides of nitrogen from combustion effluent gases by introducing a carrier gas and an injection chemical into a nozzle to be mixed together, and then ejecting the mixture from the nozzle into a flue gas duct to provide intimate mixing between the injection chemical and the nitrogen oxides containing combustion effluent gas. (See the Abstract and column 5, lines 18-62.) One of ordinary skill in the art would be motivated to do so, since Jones '298 teaches at column 5, lines 41-45 that the nozzle system injects air as a carrier fluid and a peroxy initiator, which peroxy initiator is also employed in the process of Jones '325 for the same purpose of removing nitrogen oxides from a combustion effluent gas. Moreover, Jones '298 discloses at column 3, lines 18-24 that the mixing technique

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disclosed therein results in maximizing rapid contact between the injection chemicals and the nitrogen oxide molecules in the flue gas, which one of ordinary skill in the art would appreciate as a desirable attribute in the process of Jones '325.

Claims 2, 4, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones '325 as applied to claim 1 above, and further in view of Dayen. It would be further obvious from Dayen to add potassium hydroxide in particulate form to the effluent stream of Jones '325 after contact with the peroxy initiator, since Jones '325 suggests at column 3, lines 41-56 that surprisingly high nitrogen oxides removal levels were observed by means of particulate sorbents, specifically mentioning sodium based sorbents at column 9, lines 35-39, and Dayen discloses the removal of nitrogen oxides from flue gas by injecting potassium hydroxide in powder form into the flue gas. (See column 5, line 46 - column 7, line 10 of Dayen.) One of ordinary skill in the art would be motivated from Dayen to substitute potassium hydroxide for the sodium based sorbents employed by Jones '325, since Dayen discloses the advantages of potassium hydroxide over sodium hydroxide as the sorbent at column 3, lines 14-46, and one of ordinary skill in the art would appreciate that such advantages would be desirable in the process of Jones '325.

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Claims 6, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones '325 in view of Jones '298 as applied to claim 3 above, and further in view of Dayen. Dayen is relied upon as discussed hereinbefore. It would be further obvious from Dayen to inject potassium hydroxide in particulate form to the stream of Jones '325 after the introduction of the peroxy initiator in such process, for the reasons given hereinbefore.

Claims 1-11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is indefinite as to whether the claims require that the effluent stream contains both NO and NO₂, or whether they embrace containing only one of such compounds, since the preambles of claims 1, 6 and 8 recite that the effluent stream contains "NO and/or NO₂", which will embrace a situation in which the effluent stream contains NO but not NO₂, or NO₂ but not NO, whereas the equations recited in claims 1, 6 and 8 appear to require the presence of both NO and NO₂.

McCrea et al. and Donnelly et al. are made of record for disclosing the removal of nitrogen oxides from flue gases by injection of a particulate alkali metal compound adsorbent.

Epperly et al., von Wedel et al., Kiiskila et al., Osborne et al. and Satoh are made of record for disclosing methods for

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removing nitrogen oxides from exhaust gases by treatment with hydrogen peroxide.

Hashimoto et al. and Nagaoka et al. are made of record for disclosing methods for removing nitrogen oxides from effluent gases by treatment with aqueous solutions of potassium hydroxide.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (703) 308-0248. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2351.

WAL:cdc

September 30, 2003

Wayne A. Langel
WAYNE A. LANGEL
PRIMARY EXAMINER